

CLAIMS

What is claimed is:

1. A method of identifying a tumor comprising the steps of:
 - a) obtaining a sample derived from an organ or tissue;
 - 5 b) determining the expression pattern of one or more marker genes in the sample, said one or more marker genes selected from the group consisting of the genes in FIGS. 1A-1R2, FIGS. 2A-2T2, FIGS. 3A-3Z2, FIGS. 4A-4S2, FIGS. 5A-5M2, FIGS. 6A-6W2, FIGS. 7A-7D3, FIGS. 8A-8X2, FIGS. 9A-9C3, FIGS. 10A-10P2, FIGS. 11A-11O2, FIGS. 10 c) comparing the expression pattern obtained in step b) to the expression pattern of one or more genes specific to a tumor, wherein a marker gene expression pattern in the sample that is similar to the gene expression pattern specific to a tumor identifies a tumor.
- 15 2. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 1A-1R2 and whereby the tumor identified is a bladder tumor.
- 20 3. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 2A-2T2 and whereby the tumor identified is a breast tumor.
4. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 3A-3Z2 and whereby the tumor identified is a central nervous system (CNS) tumor.

5. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 4A-4S2 and whereby the tumor identified is a colorectal tumor.
6. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 5A-5M2 and whereby the tumor identified is leukemia.
7. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 6A-6W2 and whereby the tumor identified is a lung tumor.
- 10 8. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 7A-7D3 and whereby the tumor identified is a lymphoma.
9. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 8A-8X2 and whereby the tumor identified is a melanoma.
- 15 10. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 9A-9C3 and whereby the tumor identified is a mesothelioma.
11. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 10A-10P2 and whereby the tumor identified is an ovarian tumor.

12. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 11A-11O2 and whereby the tumor identified is a pancreatic tumor.

13. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 12A-12V2 and whereby the tumor identified is a prostate tumor.

14. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 13A-13N2 and whereby the tumor identified is a renal tumor.

10 15. A method according to Claim 1, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 14A-14A3 and whereby the tumor identified is a uterine tumor.

16. A method of predicting the likelihood of tumor development in a subject, comprising the steps of:

15 a) obtaining a sample derived from an organ or tissue of a subject;

b) determining the expression pattern of one or more marker genes in the sample, said one or more marker genes selected from the group consisting of the genes in FIGS. 1A-1R2, FIGS. 2A-2T2, FIGS. 3A-3Z2, FIGS. 4A-4S2, FIGS. 5A-5M2, FIGS. 6A-6W2, FIGS. 7A-7D3, FIGS. 20 8A-8X2, FIGS. 9A-9C3, FIGS. 10A-10P2, FIGS. 11A-11O2, FIGS. 12A-12V2, FIGS. 13A-13N2, and FIGS. 14A-14A3; and

c) comparing the expression pattern obtained in step b) to the expression pattern of one or more genes specific to a tumor,

wherein a marker gene expression pattern in the sample that is similar to the gene expression pattern specific to a tumor indicates an increased likelihood of tumor development in the subject.

17. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 1A-1R2 and whereby the tumor for which a likelihood of development is predicted is a bladder tumor.
- 5 18. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 2A-2T2 and whereby the tumor for which a likelihood of development is predicted is a breast tumor.
- 10 19. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 3A-3Z2 and whereby the tumor for which a likelihood of development is predicted is a central nervous system (CNS) tumor.
- 15 20. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 4A-4S2 and whereby the tumor for which a likelihood of development is predicted is a colorectal tumor.
21. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 5A-5M2 and whereby the tumor for which a likelihood of development is predicted is leukemia.
- 20 22. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 6A-6W2 and whereby the tumor for which a likelihood of development is predicted is a lung tumor.

23. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 7A-7D3 and whereby the tumor for which a likelihood of development is predicted is a lymphoma.
24. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 8A-8X2 and whereby the tumor for which a likelihood of development is predicted is melanoma. 5
25. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 9A-9C3 and whereby the tumor for which a likelihood of development is predicted is a mesothelioma.
- 10 26. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 10A-10P2 and whereby the tumor for which a likelihood of development is predicted is an ovarian tumor.
- 15 27. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 11A-11O2 and whereby the tumor for which a likelihood of development is predicted is a pancreatic tumor.
- 20 28. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 12A-12V2 and whereby the tumor for which a likelihood of development is predicted is a prostate tumor.
29. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 13A-13N2 and whereby the tumor for which a likelihood of development is predicted is a renal tumor.

30. A method according to Claim 16, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 14A-14A3 and whereby the tumor for which a likelihood of development is predicted is a uterine tumor.

31. A method of diagnosing a tumor in a subject, comprising the steps of:

5 a) obtaining a sample derived from an organ or tissue of a subject;

 b) determining the expression pattern of one or more marker genes in the sample, said one or more marker genes selected from the group consisting of the genes in FIGS. 1A-1R2, FIGS. 2A-2T2, FIGS. 3A-3Z2, FIGS. 4A-4S2, FIGS. 5A-5M2, FIGS. 6A-6W2, FIGS. 7A-7D3, FIGS. 8A-8X2, FIGS. 9A-9C3, FIGS. 10A-10P2, FIGS. 11A-11O2, FIGS. 10 12A-12V2, FIGS. 13A-13N2, and FIGS. 14A-14A3; and

 c) comparing the expression pattern obtained in step b) to the expression pattern of one or more genes specific to a tumor, wherein a marker gene expression pattern in the sample that is similar to the gene expression pattern specific to a tumor indicates the presence of a tumor in the subject.

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32. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 1A-1R2 and whereby the tumor that is diagnosed is a bladder tumor.

20 33. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 2A-2T2 and whereby the tumor that is diagnosed is a breast tumor.

34. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 3A-3Z2 and whereby the tumor that is diagnosed is a central nervous system (CNS) tumor.

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35. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 4A-4S2 and whereby the tumor that is diagnosed is a colorectal tumor.
36. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 5A-5M2 and whereby the tumor that is diagnosed is leukemia.
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37. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 6A-6W2 and whereby the tumor that is diagnosed is a lung tumor.
- 10 38. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 7A-7D3 and whereby the tumor that is diagnosed is a lymphoma.
39. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 8A-8X2 and whereby
15 the tumor that is diagnosed is a melanoma.
40. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 9A-9C3 and whereby the tumor that is diagnosed is a mesothelioma.
41. A method according to Claim 31, wherein said one or more marker genes are
20 selected from the group consisting of the genes in FIGS. 10A-10P2 and whereby the tumor that is diagnosed is an ovarian tumor.

42. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 11A-11O2 and whereby the tumor that is diagnosed is a pancreatic tumor.

5 43. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 12A-12V2 and whereby the tumor that is diagnosed is a prostate tumor.

44. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 13A-13N2 and whereby the tumor that is diagnosed is a renal tumor.

10 45. A method according to Claim 31, wherein said one or more marker genes are selected from the group consisting of the genes in FIGS. 14A-14A3 and whereby the tumor that is diagnosed is a uterine tumor.

46. A method of identifying a compound for use in treating cancer, said method comprising the steps of:

15 a) providing a cell or cell lysate sample;

b) contacting the cell or cell lysate sample with a candidate compound; and

c) detecting a decrease in expression of one or more genes specific to a tumor, said one or more genes selected from the group consisting of the genes in FIGS. 1A-1R2, FIGS. 2A-2T2, FIGS. 3A-3Z2, FIGS. 4A-4S2, FIGS. 5A-5M2, FIGS. 6A-6W2, FIGS. 7A-7D3, FIGS. 8A-8X2, FIGS. 20 9A-9C3, FIGS. 10A-10P2, FIGS. 11A-11O2, FIGS. 12A-12V2, FIGS. 13A-13N2, and FIGS. 14A-14A3, wherein a candidate compound that decreases the expression of one or more genes specific to a tumor identifies a compound for use in treating cancer.

47. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 1A-1R2 and whereby the compound identified is useful for treating bladder cancer.

48. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 2A-2T2 and whereby the compound identified is useful for treating breast cancer.

49. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 3A-3Z2 and whereby the compound identified is useful for treating central nervous system (CNS) cancer.

50. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 4A-4S2 and whereby the compound identified is useful for treating colorectal cancer.

51. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 5A-5M2 and whereby the compound identified is useful for treating leukemia.

52. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 6A-6W2 and whereby the compound identified is useful for treating lung cancer.

53. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 7A-7D3 and whereby the compound identified is useful for treating lymphoma.

54. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 8A-8X2 and whereby the compound identified is useful for treating melanoma.

55. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 9A-9C3 and whereby the compound identified is useful for treating mesothelioma.

56. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 10A-10P2 and whereby the compound identified is useful for treating ovarian cancer.

10 57. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 11A-11O2 and whereby the compound identified is useful for treating pancreatic cancer.

58. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 12A-12V2 and whereby the compound identified is useful for treating prostate cancer.

15 59. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 13A-13N2 and whereby the compound identified is useful for treating renal cancer.

60. A method according to Claim 46, wherein said one or more genes are selected from the group consisting of the genes of FIGS. 14A-14A3 and whereby the compound identified is useful for treating uterine cancer.

61. An oligonucleotide microarray having immobilized thereon a plurality of oligonucleotide probes specific for one or more tumor specific genes selected from the group consisting of the genes in FIGS. 1A-1R2, FIGS. 2A-2T2, FIGS. 3A-3Z2, FIGS. 4A-4S2, FIGS. 5A-5M2, FIGS. 6A-6W2, FIGS. 7A-7D3, FIGS. 8A-8X2, FIGS. 9A-9C3, FIGS. 10A-10P2, FIGS. 11A-11O2, FIGS. 12A-12V2, FIGS. 13A-13N2, and FIGS. 14A-14A3.

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62. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 1A-1R2.

10 63. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 2A-2T2.

15 64. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 3A-3Z2.

65. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 4A-4S2.

20 66. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 5A-5M2.

67. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 6A-6W2.

68. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 7A-7D3.

5 69. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 8A-8X2.

10 70. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 9A-9C3.

15 71. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 10A-10P2.

72. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 11A-11O2.

20 73. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 12A-12V2.

74. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 13A-13N2.

5 75. The oligonucleotide microarray of Claim 61, wherein said oligonucleotide probes specific for one or more tumor specific genes are selected from the group consisting of the genes in FIGS. 14A-14A3.

76. A method according to Claim 1, wherein the marker gene is DNA.

77. A method according to Claim 1, wherein the marker gene is mRNA.

10 78. A method according to Claim 76, wherein the expression pattern of the marker gene is determined utilizing specific hybridization probes.

79. A method according to Claim 77, wherein the expression pattern of the marker gene is determined utilizing specific hybridization probes.

80. A method according to Claim 76, wherein the expression pattern of the marker gene is determined utilizing oligonucleotide microarrays.

15 81. A method according to Claim 77, wherein the expression pattern of the marker gene is determined using oligonucleotide microarrays.

82. A method according to Claim 1, wherein determining the expression of one or more marker genes occurs by determining the level of a polypeptide encoded by said one or more marker genes.

83. A method according to Claim 82, wherein the level of said polypeptide is determined utilizing antibodies.